PORTABLE ELECTRONIC DEVICE CONNECTOR

CROSS-REFERENCE TO RELATED APPLICATION

This application is a continuation application of Ser. No. 15/269,876, filed Sep. 19, 2016, which is a continuation of U.S. patent application Ser. No. 14/703,575, filed May 4, 2015, and entitled "Portable Electronic Device Connector," now U.S. Pat. No. 9,445,633, which claims the benefit to U.S. Provisional Patent Application No. 62/057,658, filed Sep. 30, 2014 and entitled "Portable Electronic Device Connector," the disclosure of each of which are hereby incorporated herein by reference in their entirety.

TECHNICAL FIELD

This disclosure relates generally to portable electronic devices, and more specifically to a connector for a portable electronic device.

BACKGROUND

Portable electronic devices include a wide variety of different electronic devices designed to be easily transported by a user. Such electronic devices may include smart phones, digital media players, cellular telephones, mobile computing devices, wearable devices, tablet computing devices, health and fitness monitors, laptop computing devices, and so on.

Manufacturers may be limited by size, weight, and other constraints when designing portable electronic devices to be easily transported. Meeting such constraints may involve omitting components from the portable electronic devices that might otherwise be useful or using smaller but less powerful versions of components.

SUMMARY

The present disclosure details systems, apparatuses, and methods related to connectors for portable electronic devices. In some embodiments, an affixing structure of a connector may be configured to attach to an affixing structure interface of a portable electronic device that is configured to also couple the portable electronic device to an attachment member. A connector plug including spring pins or other conductors coupled to an electrical conduit may be coupled to the affixing structure. The spring pins may electrically connect to one or more electric components of the portable electronic device and the electrical conduit may electrically connect to one or more diagnostic and/or other electronic devices.

In some embodiments, an attachment member may include one or more electronic components and spring pins or other conductors connectible to a wearable device. In some embodiments, the attachment member may additionally include a connector operable to connect the wearable device to another electronic device. Such connection may allow transfer of power and/or communications between the attachment member and the electronic device and/or between the wearable device and the electronic device via the attachment member.

In various embodiments, a connector for a portable electronic device includes an affixing structure configured to attach to an affixing structure interface of a portable electronic device. The affixing structure interface may be configured to couple the portable electronic device to an attachment member. The connector may also include a connector plug coupled to the affixing structure. The connector plug may include conductors coupled to an electrical conduit. The conductors may be configured to electrically connect to an electronic component of the portable electronic device when the affixing structure is attached to affixing structure interface and the electrical conduit is configured to electrically connect to a diagnostic device.

In some embodiments, a system for connecting an electronic device to a wearable device may include an affixing structure configured to insert into a channel of a wearable device and a connector plug coupled to the affixing structure. The connector plug may include a pin coupled to an electrical conduit. The pin may be configured to electrically connect to an electronic component of the wearable device when the affixing structure is inserted into the channel and the electrical conduit is configured to electrically connect to an electronic device.

In one or more embodiments, an electronic band for a wearable device may include a band segment including an electronic component; an affixing structure, coupled to the band segment, configured to insert into a channel of a wearable device; and a conductor, coupled to the affixing structure, electrically connected to the electronic component of the band segment. The conductor may be configured to electrically connect the electronic component of the band segment to an electronic component of the wearable device when the affixing structure is inserted into the channel.

It is to be understood that both the foregoing general description and the following detailed description are for purposes of example and explanation and do not necessarily limit the present disclosure. The accompanying drawings, which are incorporated in and constitute a part of the specification, illustrate subject matter of the disclosure. Together, the descriptions and the drawings serve to explain the principles of the disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1**A is an isometric view of an electronic device having an attachment member and an affixing structure.

FIG. **1**B shows the view of FIG. **1**A with an attachment member removed.

FIG. **1**C shows the view of FIG. **1**B after a seal has been removed.

FIG. **2**A is an isometric view illustrating an example system for connecting a diagnostic device to an electronic device using a connector.

FIG. **2**B illustrates the example system of FIG. **2**A with the connector removed from the electronic device.

FIG. **3**A is a cross sectional schematic view of a connection between the connector and the electronic device, taken along line A-A of FIG. **2**A.

FIG. **3**B is a close-up view of the connector of FIG. **2**C with components removed for clarity.

FIG. **4**A is an isometric top view of the affixing structure of FIG. **2**A shown with a tab screw removed.

FIG. **4**B is a side view of the affixing structure of FIG. **2**A shown with the tab screw removed.

FIG. **4**C illustrates the view of FIG. **4**B after insertion of the tab screw.

FIG. **4**D is an isometric bottom view of the affixing structure of FIG. **2**A.

FIG. **5**A is a side view of an alternative embodiment of the affixing structure of FIG. **2**A.